Al Eyes - Smart Surveillance System

A comprehensive Al-powered surveillance system with real-time object detection, face recognition, and suspicious activity monitoring.

***** Features

- Multi-Camera Support: Automatic detection and monitoring of IP webcam cameras
- YOLOv9 Object Detection: Real-time detection of persons, weapons, and objects
- Face Recognition: LBPH-based authorized vs intruder identification
- Activity Analysis: Loitering, crowd detection, abandoned objects, weapon alerts
- Live Web Dashboard: Unified monitoring interface for all cameras
- Real-time Alerts: Instant notifications for suspicious activities

Quick Start

Prerequisites

- Python 3.8+
- IP webcam cameras accessible on your network
- Modern web browser

Installation

1. Clone the repository

```
git clone https://github.com/Praveen9964935712/AI-Eyes-on-Security.git
cd AI-Eyes-on-Security
```

2. Install dependencies

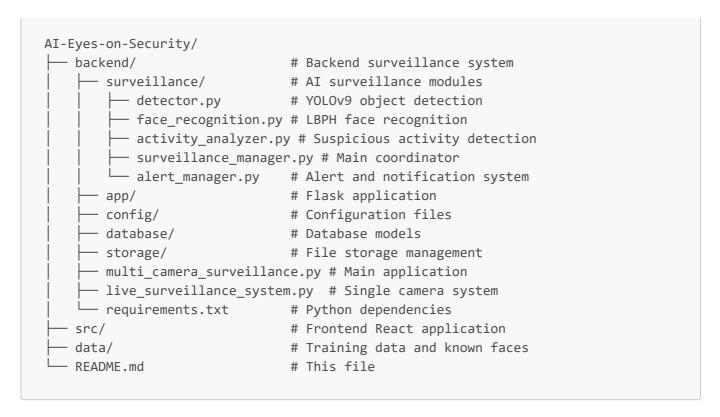
```
cd backend
pip install -r requirements.txt
```

3. Start the surveillance system

```
python multi_camera_surveillance.py
```

4. Access the dashboard Open your browser to http://localhost:5002

Project Structure



Configuration

Adding Authorized Faces

- 1. Create folders in data/known_faces/
- 2. Add 3-5 photos per person:

Camera Setup

The system automatically detects IP cameras on your network. Supported formats:

http://IP:PORT/videohttp://IP:PORT/stream

Usage

Multi-Camera Surveillance

```
cd backend
python multi_camera_surveillance.py
```

- Automatically detects all available IP cameras
- Provides unified web dashboard at http://localhost:5002
- Start/stop individual cameras or all cameras

Single Camera Surveillance

```
cd backend
python live_surveillance_system.py
```

- Processes single IP camera feed
- · Real-time AI detection and activity analysis

Alert Types

- CRITICAL: Weapon detection, unauthorized access
- WARNING: Loitering, abandoned objects, crowd detection
- **INFO**: Normal monitoring, object detection updates

X API Endpoints

- GET /api/status System status and statistics
- POST /api/start_all Start surveillance on all cameras
- POST /api/stop_all Stop all surveillance
- GET /video_feed/<camera_name> Live video stream

System Requirements

- **CPU**: Multi-core processor (Intel i5+ or AMD equivalent)
- RAM: 8GB+ recommended for multiple cameras
- **GPU**: CUDA-compatible GPU optional for faster inference
- Network: Stable connection to IP cameras
- **Storage**: 10GB+ for logs and snapshots

Security Features

- 1. Real-time Object Detection: YOLOv9 model for accurate detection
- 2. Face Recognition: LBPH algorithm for intruder identification
- 3. Activity Monitoring: Advanced behavioral analysis
- 4. Multi-Camera Correlation: Cross-camera activity tracking
- 5. Alert System: Instant notifications and logging

S Contributing

- 1. Fork the repository
- 2. Create a feature branch
- 3. Commit your changes

- 4. Push to the branch
- 5. Create a Pull Request

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& Future Enhancements

- Mobile app integration
- Cloud storage support
- Advanced AI models (YOLOv10, Transformer-based)
- Voice alerts
- Integration with security systems
- Advanced analytics dashboard

Support

For issues and questions:

- Create an issue on GitHub
- Check the documentation
- Review configuration settings